WHAT IS CLAIMED IS:

1. A method for forming a gate dielectric for a semiconductor device, comprising:

forming a nitrogen-containing oxide upon a semiconductor substrate;

forming a high-K material upon the nitrogen-containing oxide, wherein the high-K material has a dielectric constant greater than about 5;

annealing the substrate in a first ambient comprising ammonia;

annealing the substrate in a second ambient comprising nitrous oxide; and

removing a portion of the high-K material.

2. The method as recited in claim 1, wherein said forming the nitrogen-containing oxide comprises heating the semiconductor substrate to a temperature greater than about 700 °C in an ambient comprising oxygen and nitrogen.

3. The method as recited in claim 2, wherein said heating the semiconductor substrate comprises heating a monocrystalline silicon substrate.

4. The method as recited in claim 2, wherein said heating the semiconductor substrate comprises heating a silicon layer dielectrically spaced above a silicon substrate.

5. The method as recited in claim 2, wherein said heating comprises heating in an ambient comprising nitrous oxide.

6. The method as recited in claim 1, wherein said forming a nitrogen-containing oxide comprises forming an oxide having a thickness less than about 10 angstroms.

7. The method as recited in claim 1, wherein said forming the high-K material comprises depositing silicon nitride.

8. The method as recited in claim 7, wherein said depositing silicon nitride comprises depositing silicon nitride having a thickness of between about 15 angstroms and about 30 angstroms.

9. The method as recited in claim 1, wherein said forming the high-K material comprises forming a material having a dielectric constant greater than about 20.

10. The method as recited in claim 1, wherein said annealing the substrate in the first ambient comprises heating the substrate to a temperature greater than about 750 °C for a time less than or equal to about one minute.

11. The method as recited in claim 1, wherein said annealing the substrate in the second ambient comprises heating the substrate to a temperature greater than about 800 °C for a time less than or equal to about one minute.

12. The method as recited in claim 1, wherein said removing comprises etching in a flowing gas ambient at a temperature between about 500 °C and 1000 °C.

13. The method as recited in claim 12, wherein said etching comprises flowing a gas comprising hydrochloric acid and hydrogen.

14. The method as recited in claim 7, further comprising forming a dielectric having a dielectric constant greater than about 20 upon an upper surface of the silicon nitride, subsequent to said removing.

15. The method as recited in claim 1, wherein said forming the nitrogen-containing oxide, forming the high-K material, annealing the substrate in the first ambient, annealing the substrate in the second ambient, and removing the portion are performed within one or more chambers of a cluster tool.

16. A semiconductor device, comprising:

a low-trap-density nitrogen-containing oxide arranged upon an upper surface of a semiconductor substrate;

a high-K dielectric having a dielectric constant greater than about 5 arranged upon the nitrogen-containing oxide; and

a gate conductor arranged above the high-K dielectric.

17. The device as recited in claim 16, wherein said high-K dielectric comprises silicon nitride.

18. The device as recited in claim 16, wherein said high-K dielectric comprises a material having a dielectric constant greater than about 20.

19. The device as recited in claim 17, further comprising a dielectric having a dielectric constant greater than about 20 arranged upon the silicon nitride.

20. The device as recited in claim 16, further comprising:

an additional gate conductor interposed between the nitrogen-containing oxide and the semiconductor substrate; and

a gate dielectric arranged interposed between the additional gate conductor and the semiconductor substrate.

21. The device as recited in claim 16, wherein said nitrogen-containing oxide has a thickness of less than about 10 angstroms.

22. The device as recited in claim 17, wherein said silicon nitride has a thickness of less than or equal to about 10 angstroms.